SUPPORT FOR THE AMENDMENT

The amendment to the claims finds support in the present specification and claims, as originally filed as follows:

Support for the amendment of Claim 1, concerning differences in the refractive index and new Claims 20 and 21, is found in the present specification as originally filed, page 5, paragraph [0025], lines 2 to 6 from the beginning of the paragraph. Thus, the specification establishes a lower limit of refractive index of 0.05 and an upper limit of 4, "including any increments within those ranges".

Support for replacing "can be" with –is- is found in the present specification as originally filed, page 12, paragraph [0039], lines 3 to 5, from the beginning of the paragraph, and in Figures 8 to 10.

No new matter has been added to the application by virtue of the present amendment.

REMARKS

Undersigned Applicants' representative wishes to thank Examiner Ferguson for the helpful and courteous discussion regarding the merits of this application held on January 9, 2007. The substance of this discussion will be expanded upon in the remarks made below. The suggestions made by the Examiner in both the interview and the Office Action have been adopted, therefore obviating the indicated rejections.

In addition, Applicants wish to thank Examiner Ferguson for withdrawing all previous rejections.

The rejection of the claims under 35 USC § 112, is respectfully traversed.

As discussed with the Examiner Ferguson in the above mentioned interview, the Application, as originally filed, clearly discloses the wavelength of interest for a typical polymer between 4 μm and 200 μm or more; for use in the visible region between 400 μm and 700 μm; for use in the infrared region between 1 μm and 2.5 μm. (page 4, paragraph [0021]).

It is thus clear that one of ordinary skill in the pertinent art, when reading the claims in light of the supporting specification, would have been able to ascertain the claims with a reasonable degree of precision and particularity. See *Ex parte* Wu, 10 USPQ 2d 2031, 2033 (B.P.A.I. 1989); *In re* Moore, 439 F.2d 1232 169 USPQ 236, 238 (C.C.P.A. 1971); *In re* Hammack, 166 USPQ at 208.

Thus, it is clear that the language of the claims read in light of the specification. Further, it is well settled that the "language of the claims, read in the light of the specification" is to be considered when determining whether the claims are definite.

(Allen Archery Inc. v. Browning Mfg. Co., 819 F.2d 1087, 2 USPQ 2d 1490, 1494 (Fed. Cir. 1987). This precept has been incorporated into the MPEP, which states that

> "[t]he meaning of every term used in any of the claims should be apparent from the descriptive portion of the specification with clear disclosure as to its import." (MPEP §608.01 (o).)

See also:

> "[t]he meaning of the terms in the claims may be ascertainable by reference to the description" (37 C.F.R. §1.75).

Thus, the law is clear that:

> "if the claims, read in the light of the specification, reasonably apprise those skilled in the art both of the utilization and scope of the invention, and if the language is as precise as the subject matter permits, the courts can demand no more." (North Am. Vaccine, Inc. v. American Cyanamid Co., 7 F.3^{d} 1571, 28 USPQ 2d 1333, 1339 (Fed. Cir. 1993).

Clearly, Claim 1 is not indefinite. Applicants respectfully request the withdrawal of the rejection.

The rejection of the claims under 35 U.S.C. § 103 (a) over US Patent 4,540,623 to Im et al., is respectfully traversed.

What distinguishes the claims of the present application from the above cited prior art reference are as follows:

1. Examiner Ferguson has correctly pointed out that the reference discloses that good optical properties are observed even if the adjacent layers comprising the various transparent thermoplastic materials possess refractive indices which are different from one another (column 7, lines 39-43).

However, as discussed with Examiner Ferguson in the above mentioned meeting, the above disclosure must be considered in light of the additional disclosure of Im et al. which define the limits of the differences of the index of reflection as being not more than about 0.01 and preferably less than about 0.002 units. Thus, the reference states:

> A condition for transparency of carbonate polymer containing blends such as those as are used in this invention is a substantial equality of the refractive indices of the polymer constituents. In order to obtain highly transparent blends, the copolymer additives most advantageously have a refractive index which differs by not more than about 0.01, preferably less than about 0.002 unit from that of carbonate polymer. (Column 4, lines 3-10)
>
> Especially preferred thermoplastic materials employed in preparing carbonate polymer containing transparent blends include those prepared from the polymerization of styrene and acrylonitrile such that said styrene/acrylonitrile (SAN) copolymer contains an amount of acrylonitrile (AN) such that said copolymer has a refractive index which very nearly matches that of the carbonate polymer, preferably within about 0.002 unit of that of carbonate polymer. (Column 4, lines 33-41)
>
> The SAN containing about 5 to about 8 weight percent content of AN has a refractive index of about 1.584 to about 1.586. This preferred additive exhibits a refractive index which very nearly equals that of commercially available carbonate polymer, which exhibits a refractive index of about 1.586. (Column 4, lines 48- 53)
>
> Other preferred copolymers employed in preparing transparent carbonate polymer containing blends include those prepared from the polymerization of styrene and acrylic acid such that said styrene/acrylic acid (SAA) copolymer contains an amount of acrylic acid (AA) such that said copolymer has a refractive index which very nearly matches that of the carbonate polymer, preferably within about 0.002 unit of that of carbonate polymer. For example, a SAA of the present invention comprises about 1 to about 8 weight percent of AA, preferably about 7 to about 8 weight percent AA; and about 92 to less than about 100 weight percent styrene. Such a copolymer has a refractive index which nearly equals that of a commercially available carbonate polymer. (Column 5, lines 3-17)

In contradistinction, the present claims recite differences in the index of refraction of from 0.05 to 4 units.

Clearly, Im et al. teaches away from the multilayer structure of the present claims reciting that the alternating layers exhibit differences in the refractive index of 0.05 to 4 units.

2. The present claims require that the refractive index of the component (a) or component (b) is varied by tensile, compressive or shear force. Im et al. neither discloses nor suggests variable tensile, compression or shear.

The Examiner has stated in the above identified Advisory Action **(Continuation of 13)** that, although there is support for the phrase "can be varied by tensile, compressive or shear force" in the specification, there is no support for the phrase "is varied by tensile, compressive or shear force". Applicants respectfully disagree. Thus, specification of the present application, as originally filed, describes Examples demonstrating, in conjunction with Figures 1-3 and 8-10 the fact that the refractive index **is** varied by tensile, compressive or shear force, and, thus providing ample support for the amendment to Claim 1.

In particular, the present specification as originally filed states:

> "In each of the layered polymer materials in Figure 1, the effective refractive index of the composite polymer film varies with the applied pressure. The data in Figure 1 was recorded with both increasing and decreasing applied pressure." (Page 13, lines 12-15)

Further, on page 18, the present specification as originally filed, states:

> "The variation in the refractive index with tension was demonstrated qualitatively in multi-layered films." (Page 18, lines 6-7)

In addition, on page 12 the present specification as originally filed states:

> "As illustrated in Figures 8 to 10, elastomeric nanolayered materials enable us to dynamically alter the thickness of either one or both layers by applying compression, tension, or shear forces." (Page 12, lines 11-13)

Further, under "BRIEF DESCRIPTION OF THE CLAIMS" the present application, as originally filed, states for Figures 1 to 3 and 8 to 10:

> **Figure 1** shows reversible refractive index variation as a function of applied pressure in 50 %, 75 % and 90 % elastomeric films. All films are layered poly(ethylene- octene) (EO) and PC.
> **Figure 2** shows reflectance spectra of EO/PC (50/50) multilayer film. Reflectance maxima shift to blue as pressure is applied perpendicular to the layers.
> **Figure 3** shows comparative plots of change in reflectance maxima, $\Delta\lambda$, as a function of pressure. A slope of 3.3 and 2.2 nm/MPa were found for the 75/25 and the 50/50 EO/PC films, respectively.
> **Figure 8** shows altering the relative layer thickness and hence the index of refraction of a layered by compression.
> **Figure 9** shows how the layer thickness also can be tuned by tension. The tension can be applied in one or two directions as indicated. It can also be applied radially.
> **Figure 10** shows how the layer thickness can be tuned by strain. Strain is particularly useful when one of the layers is quite rigid.

Thus, the above brief description, together with the Figures on pages 35-37, clearly show the effect of compression, tension, and shear forces, in other words, what exactly happens.

The examiner's attention is respectfully directed to the following:

> "Prior to determining whether the disclosure satisfies the written description requirement for the claimed subject matter, **the examiner should review the claims and the entire specification, including the specific embodiments, figures, and sequence listings, to understand how applicant provides support for the various features of the claimed invention.** An element may be critical where those of skill in the art would require it to determine that **applicant was in possession of the invention.**" (MPEP 2163, bold emphasis added).

And again:

> "The test for sufficiency of support in a parent application is whether the disclosure of the application relied upon "**reasonably conveys to the artisan that the inventor had possession at that time of the later claimed subject matter.**" *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)); see also MPEP 2163.02)

Further, US Patent law describes when the applicant shows possession of the claimed invention as follows:

> "An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, **figures**, diagrams, and formulas that fully set forth the claimed invention. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997; bold emphasis added); see also MPEP 2163.02).

See also the statement in the MPEP the fact that literal description is not required:

> "**The subject matter of the claim need not be described literally (i.e., using the same terms or *in haec verba*) in order for the disclosure to satisfy the description requirement**." (MPEP 2163, bold emphasis added)

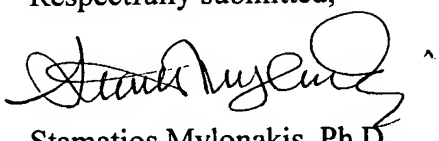
Clearly, the specification as a whole provides ample support for the amendment to the claims; further, Applicants have shown possession of their claimed invention at the time the application was filed as required by patent law.

For the above reasons Im neither discloses nor suggests the claims of the present invention. Applicants respectfully request the withdrawal of the rejection.

Applicants submit that the application is now ready for allowance and early notification to that effect will be greatly appreciated.

Customer No.: 28727

Respectfully submitted,



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MARKED-UP SHEET

1. (Currently amended) A multilayer structure comprising,

a plurality of at least two alternating layers A and B represented by formula $(AB)_x$, where $x = 2^n$, and n is in the range of from 4 to 15;

wherein layer A is comprised of component (a) and layer B is comprised of component (b);

said alternating layers are comprised of different polymers exhibiting differences in the index of refraction and in the elastic moduli; wherein said differences in the index of refraction are between 0.05 and 4 units;

wherein the layer thickness of said layer A and B are less than one quarter of the wavelength of interest;

wherein said multilayer polymer structure behaves as an effective medium and wherein said structure exhibits a single refractive index;

wherein said effective medium polymeric materials are transparent; and

wherein the refractive index of said multilayered structure effective medium material [can be] is varied by tensile, compressive or shear force.

20. (New Claim) The multilayer structure of Claim 1, wherein said differences in the index of refraction are from 0.1 to 1.

21. (New Claim) The multilayer structure of Claim 1, wherein said differences in the index of refraction are from 0.3 to 1.